

**WHAT IS CLAIMED IS:**

1. An antenna element which is mounted on a circuit base board, comprising:

a dielectric substrate having an antenna pattern part;  
and

a junction conductor piercing said dielectric substrate, its one end being connected to a feeding point of said antenna pattern part, wherein

the other end of said junction conductor is connected to a feeding conductor of said circuit base board at a mounting face side of said antenna element of said circuit base board.

2. The antenna element of claim 1, wherein a space portion in which said junction conductor and said feeding conductor of a side of said circuit base board are made to connect is provided in said dielectric substrate.

3. The antenna element of claim 1, wherein a feeding point of said antenna pattern part is set to a recess portion of said dielectric substrate, and said junction conductor which is pierced to said dielectric substrate is connected to the feeding point of said antenna pattern part at an inside of said recess portion.

4. The antenna element of claim 1, wherein

said dielectric substrate has a through hole corresponding to the feeding point of said antenna pattern part, and a recess portion formed at an opening portion of said through hole correspondingly to a space portion in which said junction conductor and said feeding conductor of a side of said circuit base board are made to connect, and

said junction conductor at one end portion is connected to said feeding conductor and is stood on said circuit base board, and said junction conductor is pierced to said through hole of said dielectric substrate and is connected to said

feeding point of said antenna pattern part.

5. The antenna element of claim 1, wherein said dielectric substrate has a through hole corresponding to the feeding point of said antenna pattern part, a recess portion formed at an opening portion of said through hole correspondingly to a space portion in which said junction conductor and said feeding conductor of a side of said circuit base board are made to connect, and said junction conductor, piercing said through hole, being connected to said feeding point of said antenna pattern part at one end portion, and protruding in said recess portion at the other end portion.

6. The antenna element of claim 1, wherein said junction conductor has a pillar portion that is pierced to said through hole of said dielectric substrate and is connected to the feeding point of said antenna pattern part, and a flange portion formed in said pillar portion.

7. The antenna element of claim 6, wherein said pillar portion is set more thinly than thickness of said flange portion.

8. The antenna element of claim 1, wherein said circuit base board and said dielectric substrate are fixed by an elastically adhesive material.

9. The antenna element of claim 8, wherein said elastically adhesive material is a resin tape having adhesive layers at both faces.

10. The antenna element of claim 6, wherein said flange portion is set larger than said through hole of said dielectric substrate and smaller than a recess portion formed at an opening portion of said through hole.

11. A mounting method of an antenna element, comprising:

a process that forms an antenna element, which provides an antenna pattern part and a through hole corresponding to a feeding point of said antenna pattern part, in a dielectric substrate;

a process that connects one end portion of a junction conductor to a feeding conductor and makes the junction conductor stand on a circuit base board; and

a process that makes said junction conductor pierce to said through hole of said antenna element and also connects a pointed end portion of said junction conductor to said feeding point of said antenna pattern part.

12. A mounting method of an antenna element, comprising:

a process that forms the antenna element, which provides an antenna pattern part, a through hole corresponding to a feeding point of said antenna pattern part, and a junction conductor, being pierced to said through hole, being connected to said feeding point of said antenna pattern part at one end portion, and being made to protrude in an opening portion of said through hole at the other end portion, in dielectric substrate; and

a process that installs said antenna element on a circuit base board and connects the other end portion of said junction conductor to a feeding conductor of said circuit base board.

13. A plane antenna providing an antenna element which is mounted on a circuit base board, comprising:

a dielectric substrate installed on a circuit base board through the intervention of a first ground pattern part;

a junction conductor, being connected to a feeding point of an antenna pattern part formed in said dielectric substrate at one end portion, and being made to pierce to said dielectric substrate at the other end portion and being made to protrude in a space portion between said dielectric substrate and said circuit base board;

a feeding conductor, being led to said space portion from

an inner layer portion of said circuit base board, and being connected to the other end portion of said junction conductor; and

a second ground pattern part installed in a lower face side of said feeding conductor.

14. The plane antenna of claim 13, wherein said circuit base board and said dielectric substrate are fixed by an elastically adhesive material.

15. The plane antenna of claim 13, wherein a ground pattern part is mounted on an upper face of said circuit base board, and an insulating substrate or a shielding plate having a ground pattern part is provided to a rear face side of said circuit base board.

16. The plane antenna of claim 14, wherein said elastically adhesive material is a resin tape having adhesive layers at both faces.

17. A circuit base board on which a plane antenna providing an antenna pattern part in a dielectric substrate is mounted, comprising:

a junction conductor providing a flange portion;

a through hole formed in said dielectric substrate, said junction conductor being pierced to said through hole; and

a recess portion formed at an opening portion of said circuit base board side of said through hole, said recess portion housing said flange portion of said junction conductor, wherein

said junction conductor which is attached on said circuit base board in advance is made to pierce to said through hole of said dielectric substrate so that said flange portion is housed in said recess portion of said dielectric substrate, its pointed end portion is connected to said antenna pattern part, and said dielectric substrate and said circuit base board are also installed with close adhesion.

18. An electronic device providing an antenna element which is mounted on a circuit base board, comprising:

a dielectric substrate having an antenna pattern part;  
and

a junction conductor piercing said dielectric substrate, its one end being connected to a feeding point of said antenna pattern part, wherein

the other end of said junction conductor is connected to a feeding conductor of said circuit base board at a mounting face side of said antenna element of said circuit base board.

19. The electronic device of claim 18, wherein a space portion in which said junction conductor and said feeding conductor of a side of said circuit base board are made to connect is provided in said dielectric substrate.

20. The electronic device of claim 18, wherein a feeding point of said antenna pattern part is set to a recess portion of said dielectric substrate, and said junction conductor which is pierced to said dielectric substrate is connected to the feeding point of said antenna pattern part at an inside of said recess portion.

21. The electronic device of claim 18, wherein

said dielectric substrate has a through hole corresponding to the feeding point of said antenna pattern part, and a recess portion formed at an opening portion of said through hole correspondingly to a space portion in which said junction conductor and said feeding conductor of a side of said circuit base board are made to connect, and

said junction conductor at one end portion is connected to said feeding conductor and is stood on said circuit base board, and said junction conductor is pierced to said through hole of said dielectric substrate and is connected to said feeding point of said antenna pattern part.

22. The electronic device of claim 18, wherein said dielectric substrate has a through hole corresponding to the feeding point of said antenna pattern part, a recess portion formed at an opening portion of said through hole correspondingly to a space portion in which said junction conductor and said feeding conductor of a side of said circuit base board are made to connect, and said junction conductor, piercing said through hole, being connected to said feeding point of said antenna pattern part at one end portion, and protruding in said recess portion at the other end portion.

23. The electronic device of claim 18, wherein said junction conductor has a pillar portion that is pierced to said through hole of said dielectric substrate and is connected to the feeding point of said antenna pattern part, and a flange portion formed in said pillar portion.

24. The electronic device of claim 23, wherein said pillar portion is set more thinly than thickness of said flange portion.

25. The electronic device of claim 18, wherein said circuit base board and said dielectric substrate are fixed by an elastically adhesive material.

26. The electronic device of claim 25, wherein said elastically adhesive material is a resin tape having adhesive layers at both faces.

27. The electronic device of claim 23, wherein said flange portion is set larger than said through hole of said dielectric substrate and smaller than a recess portion formed at an opening portion of said through hole.

28. An electronic device providing a plane antenna, comprising:

a dielectric substrate installed on a circuit base board through the intervention of a first ground pattern part;

a junction conductor, being connected to a feeding point of an antenna pattern part formed in said dielectric substrate at one end portion, and being made to pierce to said dielectric substrate at the other end portion and being made to protrude in a space portion between said dielectric substrate and said circuit base board;

a feeding conductor, being led to said space portion from an inner layer portion of said circuit base board, and being connected to the other end portion of said junction conductor; and

a second ground pattern part installed in a lower face side of said feeding conductor.

29. The electronic device of claim 28, wherein said circuit base board and said dielectric substrate are fixed by an elastically adhesive material.

30. The electronic device of claim 28, wherein a ground pattern part is mounted on an upper face of said circuit base board, and an insulating substrate or a shielding plate having a ground pattern part is provided to a rear face side of said circuit base board.

31. The electronic device of claim 29, wherein said elastically adhesive material is a resin tape having adhesive layers at both faces.

32. An electronic device comprising:

a circuit base board on which a plane antenna providing an antenna pattern part in a dielectric substrate is mounted;

a junction conductor providing a flange portion;

a through hole formed in said dielectric substrate, said junction conductor being pierced to said through hole; and

a recess portion formed at an opening portion of said

circuit base board side of said through hole, said recess portion housing said flange portion of said junction conductor, wherein

said junction conductor which is attached on said circuit base board in advance is made to pierce to said through hole of said dielectric substrate so that said flange portion is housed in said recess portion of said dielectric substrate, its pointed end portion is connected to said antenna pattern part, and said dielectric substrate and said circuit base board are also installed with close adhesion.